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SOME NEW TREEHOPPERS FROM THE SOUTHWEST WITH NOTES ON OTHERS.

BY E. D. BALL,
University of Arizona, Tucson.

Treehoppers are as a rule strictly confined to a single host or to closely related species of plants. It is little wonder then that intensive collecting in the arid Southwest should bring to light a number of new species and that a number of these should represent genera not previously known from the United States, while others represent new and striking adaptations in food plants as compared with their eastern relatives.

Palonica nogalana Ball, n. sp.

Similar to *viridia* but smaller, narrower with a higher and more foliaceous crest, green with a dusky line on the back of the crest. Length ♀ 10 mm., ♂ 8 mm., width 5.5 mm.

Pronotum long low acute; crest nearly equilaterally triangular, much higher and more angular than in *viridia;* as long as in *tremulata*, but more definitely angled above, the apex rounding with a slight but definite step on the posterior face. Humeral angles one-half longer with the anterior margin less rounding than in *viridia*. The crest as seen from in front is higher and much narrower with a definite separation between its slope and that of the metapodium.

Color light green, not polished as in *viridia*. The carina on the apex of crest, and a line bordering the posterior face dusky. The apex of pronotum and elytra smoky.

Holotype[1] ♀, allotype ♂, and a pair of paratypes taken by the writer at Patagonia, Arizona, May 21, 1931. Two male paratypes taken at the same place, May 10, 1931, and one female taken at Nogales, May 23, 1929. Nymphs and adults taken on the valley cottonwood (*P. wislizeni*).

The high narrow crest, the long humeral angles and the different shade of green will at once distinguish this species.

[1]Types in the author's collection.

Telamona calva Ball, n. sp.

Smaller and darker than *gibbera*, the crest tall, upright with the dorsal margin nearly horizontal. Testaceous with a light line. Length ♀ 8 mm., ♂ 7 mm., width 4 mm.

Pronotum moderately long narrow with faint rugae. A tall narrow upright crest arising just back of the humeral angles as in *gibbera*, the anterior margin almost upright, rounding over to the nearly horizontal dorsum, which either rounds over to the slightly sloping posterior margin or else becomes oblique posteriorly and the dorsal margin meets the posterior margin in a slight angle. Crest no longer than in *gibbera* and the pronotum immediately behind it flattened, then arched and carinate before the acute apex. Humeral angles nearly right angled, narrower than in *gibbera* or *tarda*. Male inclined to be hairy with a narrow upright crest, lower than in the female, uniformly rounding above.

Color rich testaceous; the face and metapodium with a greenish cast, the central carina of the latter dark, anterior margin of crest narrowly light, posterior margin broadly so, the light areas bordered with dark.

Holotype ♀, allotype ♂, and two female paratypes taken by the writer June 24, 1931, on Blue Blossom (*Ceanothus thyrsiflorus*) growing on a bluff at Big Trees, California. This species should be placed between *gibbera* and *tarda*.

Xantholobus nigrocincta Van Duzee.

This species was described from a single female by Van Duzee and placed in the genus *Ophiderma*. The writer collected a fine series in 1930 and upon study discovered that the females show the three-humped outline of a *Xantholobus* quite plainly. The male differs from the female in color as is usual in this genus and is described below. Male smaller than female, black with white markings. Length 5 mm. Face, metapodium and pronotum back to the first inflation white, finely and thickly irrorate and punctured with black, omitting narrow white margins against which the black is emphasized, and increasing in depth of color on the pronotum until it becomes black with a posterior white band and a pair of lateral areas light. The elytral nervures are black; the legs black above, light below.

Allotype ♂, Huachuca Mountains, Arizona, May 4, 1930, taken by the writer.

Genus **BAJULATA** Ball, n. gen.

Resembling *Vanduzea* in size and venation with the pronotum bearing two extremely large inflations.

Metapodium about as in *Vanduzea*, the humeral angles more prominent and placed farther back. Pronotum sparsely pubescent, as seen from above similar in shape to *Vanduzea;* in profile with two humps like a bactrian camel, the anterior one situated just before the middle, slightly higher and more acute than the posterior one, which is considerably nearer the anterior one than the apex. The posterior portion of pronotum sloping from

base of inflation to the blunt apex, which about equals the apical cell. Elytra relatively short and broad. Venation similar to *Vanduzea*, the outer discal cell broad and only slightly curved, the apical short and broad, the base truncate with the petiole attached a little nearer the costal margin, thus forming a quandrangular second apical.

Type of the genus *Vanduzea bajula* Godg.

This genus bears about the same relation to *Vanduzea* that *Xantholobus* does to *Ophiderma* with the exception that in *Xantholobus* there are typically three inflated areas, an anterior and posterior inflation of about equal size with a smaller median one above and between. In *Bajulata* the anterior inflation appears to be absent and the median one to have increased in size.

Amastris lycioda Ball, n. sp.

Smaller, paler and with a lower arch than *obtegens* which it otherwise resembles. A small long oval pale green species. Length ♀ 4 mm.; ♂ 3 mm.

Metapodium not quite vertical and rounding over into the long low arch of the pronotum, which in turn rounds over to the blunt apex. The metapodium as seen from the front forms an equilateral triangle and the carinate dorsum of the crest is only slightly foliaceous posteriorly, the highest point about the middle instead of in front as in *obtegens*. Elytra scarcely exceeding the pronotum. Venation similar to that in *obtegens* except that the apical cell is larger with the petiole nearer the center than shown by Fowler for that species. Color uniform pale green, the males with venter and femora black.

Holotype ♀, allotype ♂, and five paratypes July 24, 1930, five paratypes August and September, all taken by the writer at Tucson, Arizona. This is the first representative of this tropical genus to be taken north of central Mexico. Its small size, green color, and long oval outline will at once distinguish it.

Amastris templa Ball, n. sp.

Resembling *lycioda* in form but slightly smaller, rounder, with a broader pronotum. Straw color (green in life). Length ♀ 3.75 mm.; ♂ 3 mm.

Metapodium rapidly rounding back to a point back of the humeral angles, where it joins the arch of pronotum without a sinuation. Pronotum as seen from side lower and more uniformly rounding than in *lycioda*. Apex much broader and more bluntly rounding than in *obtegens* or *lycioda*. As seen from in front the metapodium is roundingly narrowing above, the pronotum broader and flatter than in *lycioda* with only traces of a carina. The elytra are broader and there are usually extra cells along the costa. The apical cell is small and rests against the costa rather than the apex, the base is obtusely angled and the petiole short.

Color pale powdery green in life, fading to straw yellow, the venter and femora black in the male.

Holotype ♀, allotype ♂, and ten paratypes taken by the author at

St. George, Utah, May 17, 1913. The broader form, more uniform oval and the small cells along costa will readily separate this species.

Publilia modesta var, **brunnea** Ball, n. var.

Form and structure of *modesta* nearly the metapodium rounding back and joining the crest without an angle or sinus. Pronotum smooth, polished, without lateral carinae and with a long acute apex. Color uniform shining mahogany brown. Length ♂ 4.3 mm.

Holotype ♂ and one paratype ♂ Trinidad, Colorado, August 8, 1925 (C. J. Drake), one paratype ♂ Ames, Iowa, May 15, 1897, taken by the author. This may prove to be a distinct species when its life history and food plants are determined. Variety *reticulata* V. D. appears to be a distinct species with an almost vertical metapodium forming a definite angle with the dorsal line, instead of rounding over as in *modesta*.

Stictopelta caerulea Ball, n. sp.

Slightly larger and broader than *nova*. Brownish olive above with lateral caerulean crescents. Length 7–8 mm., width 4.2 mm.

Metapodium broader and flatter than in *arizona*, rounding into the broad flat dorsum of the pronotum, much less arched than in *nova*, face relatively shorter and broader than in either species, lateral angles broad as in *nova*. Apex of pronotum as seen from side rounding up from below to a blunt tip.

Color pronotum pale olive brown in female, dark olive brown in the male, with the lateral margin from the humeral angle to just before the apex broadly marked with a caerulean blue stripe, the upper boundary of which is arched. The base of metapodium with a white line which extends to the humeral angles.

Holotype ♀, allotype ♂, and eight paratypes, September 22, 1929, four paratypes, September 19, 1930, and one October 10, 1931, all taken in Sabino Canyon near Tucson, Arizona, by the author.

This is a strikingly distinct and beautiful species allied to *varians* of Fowler but differing in color.

Sticopelta pulchella Ball, n. sp.

Shorter and broader than *nova* with a higher pronotum. Olive brown (female), or dark brown (male), with two transverse white bands enclosing small black spots. Length 6–7 mm., width 4 mm.

Metapodium higher and more upright than in *caerulea*, the pronotum higher and shorter, therefore more arched as seen from the side. The humeral angles broad and rounding. Apex of pronotum broad, abruptly narrowed from both sides.

Color, female with the pronotum pale olive green, a broad irregular margined transverse white band just before the dark brown apex, another interrupted white band between this and the humeral angles. The latter appears as a pair of broad white triangles that do not reach the median

line above. These white areas with a few rather large round dark spots. Male brown to dark brown or pitchy with the same white areas.

Holotype ♀, allotype ♂, and four pairs of paratypes, Baboquivari Mountains, September 19, 1931, six paratypes Sabino Canyon, September 22, 1929, all taken by the author. Another beautiful and distinct species.

Scalmophorus minutus Ball, n. sp.

Resembling *reticulatus* but smaller, narrower with the horn bluntly rounding instead of pointed. Uniform pale cinnamon brown. Length 5–6 mm., width scarcely 1 mm.

Face and metapodium in the same plane, the metapodium gradually and regularly narrowing to the slightly foliaceous apex of the horn with only a trace of a carina. Horn as seen from the side extending upwards at a very slight angle, straight or very slightly curved downwards at the apex. Horn as long as the remainder of the pronotum, gradually tapering to a bluntly rounding apex one-half as wide as the base. Pronotum back of horn very low, slender and tapering to the apical cells, with a single strong carina on the apical portion. Venation slightly reticulate with a petiolate apical cell of varying size. Color uniform cinnamon with only the eyes darker.

Holotype ♀, allotype ♂, and one paratype taken by the writer on Chihuahua Pine (*P. leiophylla*), Chiricahua Mountains, August 23, 1931.

Hypsoprora nogolata Ball, n. sp.

A small straw-colored species with brown mottling. The pronotum long slender and strongly bisinuate, the dorsal process short, nearly upright, much inflated. Length of body 3 mm., of process in female 2 mm., in male, 1 mm.

As seen from the front the dorsal process is slightly more constricted above the metapodium than in *anatima* and less than half as long, only slightly longer than the metapodium or face in the female and still shorter in the male. From the side the dorsal process in the female is inclined anteriorly but is shorter thicker and more upright than in *simplex*, while the posterior processes are similar. In the male it is very short, about half the height of the metapodium, upright in front and overhanging behind with a faint carina in both sexes. The elytra are coriaceous on the basal half and deeply pustulate, the pustules extending farther along the nervures. The venation is irregularly reticulate.

Holotype ♀, allotype ♂, and six paratypes, Nogales, Arizona, September 20, 1931. Eight paratypes, Tombstone, Arizona, June 14, 1932, all taken by the author on the Desert Broom (*Baccharis sarothroides*), and only on clumps growing singly on dry hills.

Microcentrus lynx Ball, n. sp.

Resembling *perdita*, slightly longer and slenderer, with the dorsal processes taller, parallel margined and overhanging in the female. Color

brown but appearing almost silver gray owing to the heavy white pubescens. Length 8 mm., width 2.6 mm.

Much smaller and narrower than *schaefferi*, with the super-humeral smaller and more upright in the female, spreading, acute and spine-tipped in the males. As seen from the front the superhumerals in the female are almost upright on their outer margins and do not equal the humerals, while in *schaefferi* they overhang the humerals by more than the width of those processes. In the male the superhumerals are lower and much more flaring, almost horizontal at the apex and slightly wider than the humerals. As seen from above the male superhumerals are wing-like, angled in front and emarginate behind with an acute tip like the ear of a lynx. Posterior process more strongly arched and crested than in *perdita*, less so than in *schaefferi*. Face with a pair of conical protuberances on the upper margin above the ocelli. Color pearly gray due to a heavy pilosity over a cinnamon brown base. Minute brown spots on wings.

Holotype ♀, allotype ♂, and four paratypes, Palmer Lake, Colorado, July 23, 1900, a pair of paratypes, Durango, Colorado, August 3, 1900, all taken from low mat-like clumps of oaks (prob. *Q. gambelli*), by the author.

In general the humerals of *schaefferi* extend forward while the foliaceous portion is vertical, and in this species they extend upward and the foliaceous portion is horizontal.

Microcentrus auirtus, Ball, n. sp.

Resembling *lynx*, slightly stouter, darker, the superhumerals in the female longer, more inclined forward and expanded towards apex, chocolate brown with a light sheen. Length 8–9 mm., width 3 mm. Color of *schaefferi* nearly smaller with the superhumerals in the female extending obliquely forwards and outwards in a straight line much longer and more expanded at apex than in *lynx*, with the posterior (upper) half obliquely shorter than the anterior lobe. Male superhumerals almost horizontal, inclined forward more than in *lynx*, and wider toward apex with a similar spine-like tip. Posterior process of same length and with a node-like crest at each end as in *lynx*. Upper margin of face with a pair of conical protuberances as in *lynx*.

Holotype ♀, allotype ♂, and one paratype Huachuca Mountains, Arizona, June 15, 1930, paratypes Chiricahua Mountains, July 5, 1930, August 23, 1931, Santa Rita Mountains, January 30, 1929, July 13, 1930, and two from Granite Dells, Oct. 6, 1929, all taken on oaks by the author.

Microcentrus nicholi Ball, n. sp.

Much smaller and more fragile than *lynx*, with small slender superhumerals in the female and only low carinae in the males. Color yellowish testaceous. Length 6–7 mm., width 1.7 mm.

Face short, sharply retreating on a line below the eyes, thus appearing still shorter. Projections on the upper margin above the ocelli broadly angularly protuberant. Metapodium with a definite shelf back of frontal

projections, then upright to the truncated-cone-like dorsum, the margins slightly carinated and dark lined in the male, the lateral margins obliquely elevated into long triangular projections which are again dark lined in the female. Posterior process short as in *caryae*, only slightly exceeding the forks of the scutellum. Elytra with the clavus and the corium back to the cross nervures entirely coriaceous and heavily pustulate, beyond this point hyaline. The ovipositor and pygofers are extremely long and slender and the female segment is only broadly excavated. Color testaceous, paler behind the superhumerals and across the base of the clavus, the posterior process white with a black tip.

Holotype ♀ and one paratype ♀ taken on pine in the Chiricahua Mountains, June 20, 1928, by A. A. Nichol. Allotype ♂ and one paratype ♂ taken by the writer from *Pinus leiophylla* in the same place, August 23, 1931, named in honor of Mr. A. A. Nichol, whose observations on food plants and life histories of Homoptera have proved to be exceptionally accurate and valuable.

Enchenopa permutata Van Duzee.

Van Duzee described this species in 1908 from 10 females from St. George, Utah, and two females from Arizona. He called attention at the time to its characters as intermediate between *Enchenopa* and *Leioscyta* and stated that he formerly considered it as the female of *L. ferrugipennis* var. *testacea.*

This species is common on *Lycium wrightii* in southern Utah and Arizona and the writer has collected hundreds of examples in each area trying to find a male with the dorsal horn like the female. Instead, he has found that all the males are without horns, and that many of the females are hornless. While the rest of the females possess definite horns which vary somewhat in size and in the angle of projections but do not grade down to the hornless condition. The hornless forms are typical representatives of *Leioscyta* and resemble *testacea.* They are, however, quite distinct from that form as represented by the types from Rifle and Grand Junction, Colorado. The writer has collected *testacea* in abundance on greasewood (*Sarcobatus vermiculatus*) in western North Dakota, Colorado, Utah, Nevada, and California as far south as the Mojave Desert. He has not taken it in extreme southern Utah or in Arizona, and has never found a horned female. It is likely that the examples of *testacea* that Van Duzee cites from St. George, Utah, and Arizona, were really the hornless forms of *permutata.*

In 1929 Goding redescribed the horned female as *Tritropidia utahensis* from a single female from Santa Clara, Utah. This location is only a few miles from St. George, the type locality of *permutata.* In the same paper he redescribed the hornless form as *Leioscyta trinotata* from a single female from Millican, Utah. The female of this remarkable species appears to have had entirely too much attention while the male has not been mentioned; it may be characterized as follows:

Male resenbling the unarmed female, smaller and usually darker, the angle of the metapodium and dorsum very slightly acute but the apex is

broadly rounded with the carina less prominent than in *testacea* or *nitida*. The anterior sinuation on the dorsum either weak or wanting as it is in the unarmed female.

Color varying from soiled straw to dusky brown, an oblique pale band across the pronotum and elytra in the region of the cross nervures emphasized and black bordered on the pronotum. Length 4–4.5 mm.

Allotype ♂, St. George, Utah, May 17, 1913, taken by the writer on *Lycium*.

Tylocentrus reticulatus Van Duzee.

This species was described from southern Utah and Arizona, where it occurs commonly on the mesquite. Goding has recently redescribed it as *Orthobelus felinus* from an Arizona female. It is certainly entirely out of place in the West Indian genus *Orthobelus* even if it had not been made the type of *Tylocentrus*.